

VIRTUAL ELEMENT SCHEMES FOR AN ACOUSTIC VIBRATION PROBLEM

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ABSTRACT. In this paper we study and analyze a virtual element method (VEM) introduced in [1] for the approximation of an acoustic vibration problem. An important feature of VEM is that suitable stabilizing forms, depending on appropriate parameters, have to be introduced in order to guarantee consistency and stability of the approximation. This is due to the virtual nature of the basis functions corresponding to the degrees of freedom at the interior of elements. In the case of the approximation of eigenvalue problems by means of virtual elements it has been observed recently in [2] that the choice of the optimal parameters for the computation of the eigenvalues might not be an easy task. Here I present some new results on the approximation of the eigenvalue for the acoustic vibration problem showing that in some cases there is no need of using any stabilization for the stiffness and mass matrix. These results have been obtained, in collaboration with Daniele Boffi, Linda N. Alzaben and Andreas S. Dedner.

Keywords: Eigenvalue problem; Virtual element method; Stabilization free VEM; Acoustic problem; Discrete compactness property.

Mathematics Subject Classifications (2010): 65N25, 65N30, 70J30, 76M10.

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